

No. 657,604.

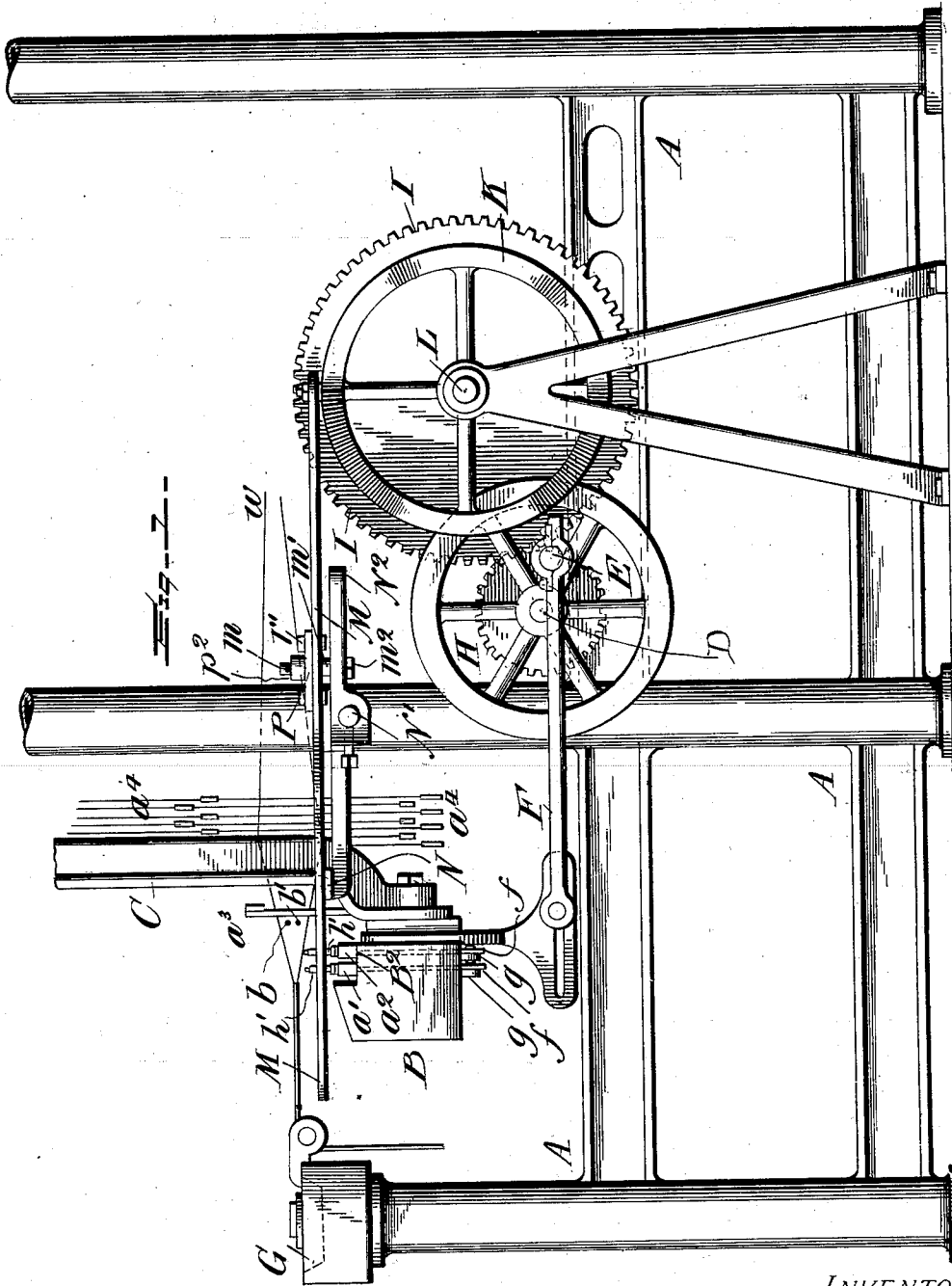
Patented Sept. 11, 1900.

G. F. KUETT.
LOOM.

(Application filed July 2, 1900.)

(No Model.)

5 Sheets—Sheet 1.



WITNESSES:

L. C. Hills
Witness

INVENTOR:

George F. Kuett,

BY *Marshall Bailey*
his Attorney

No. 657,604.

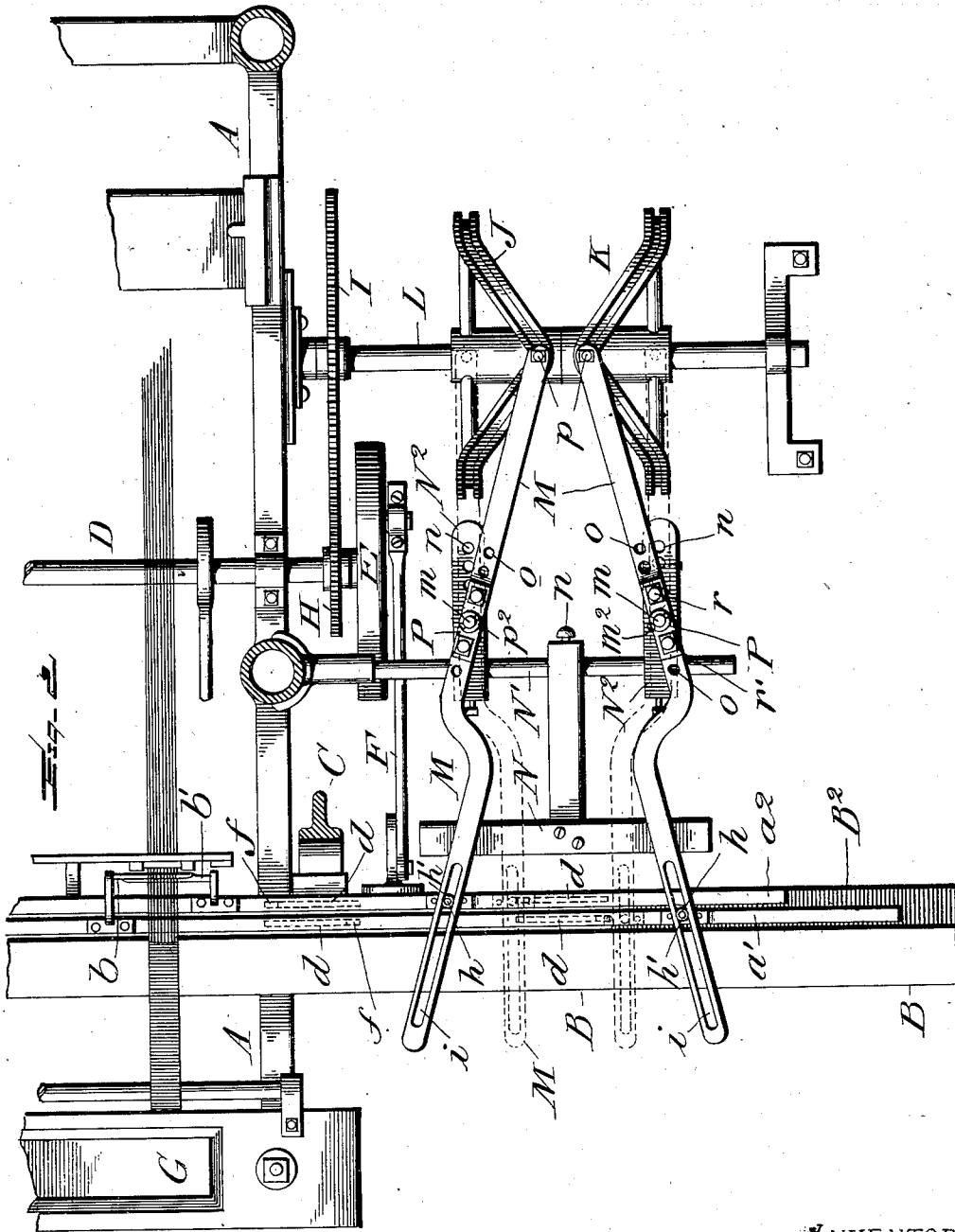
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(No Model.)

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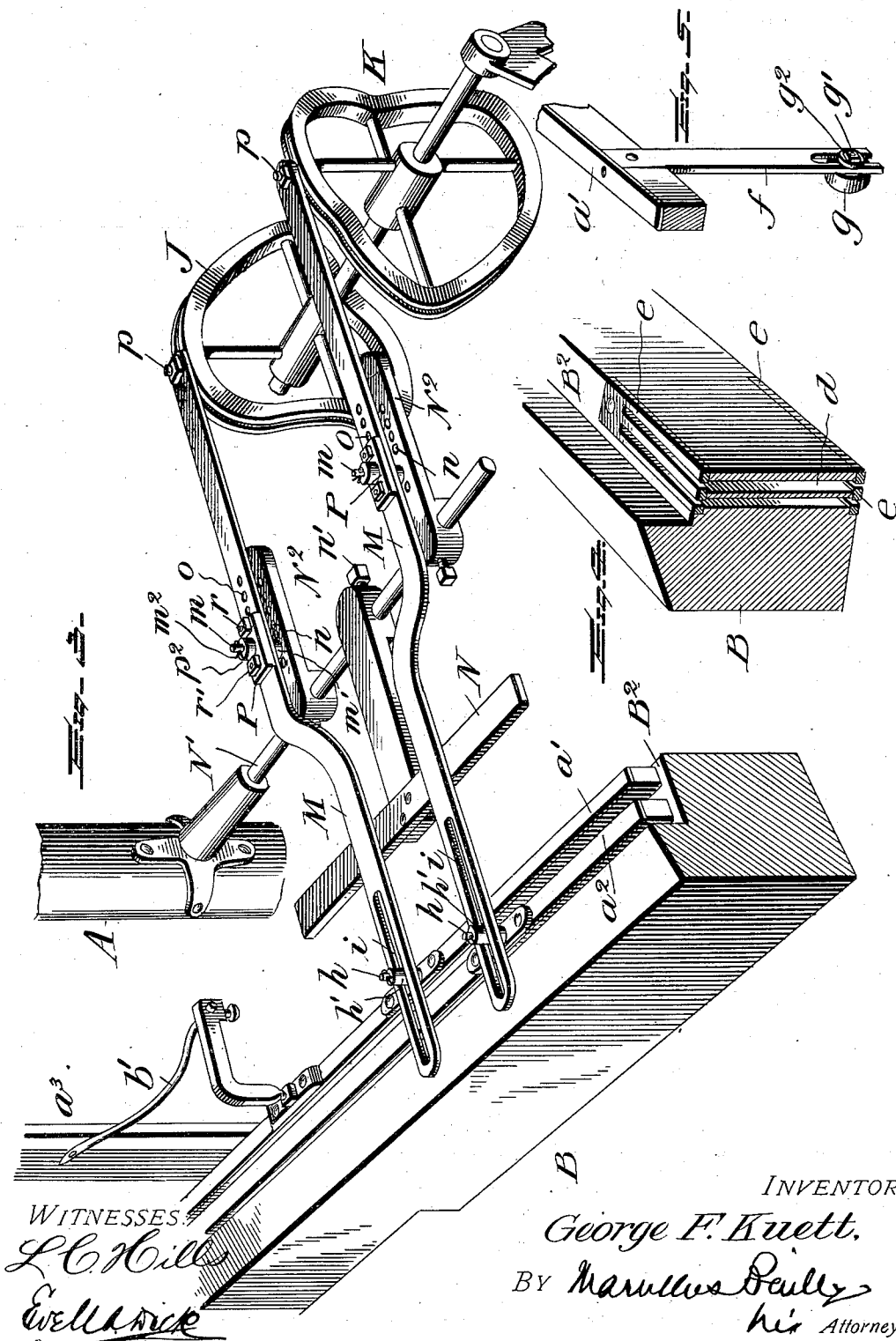
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WITNESSES

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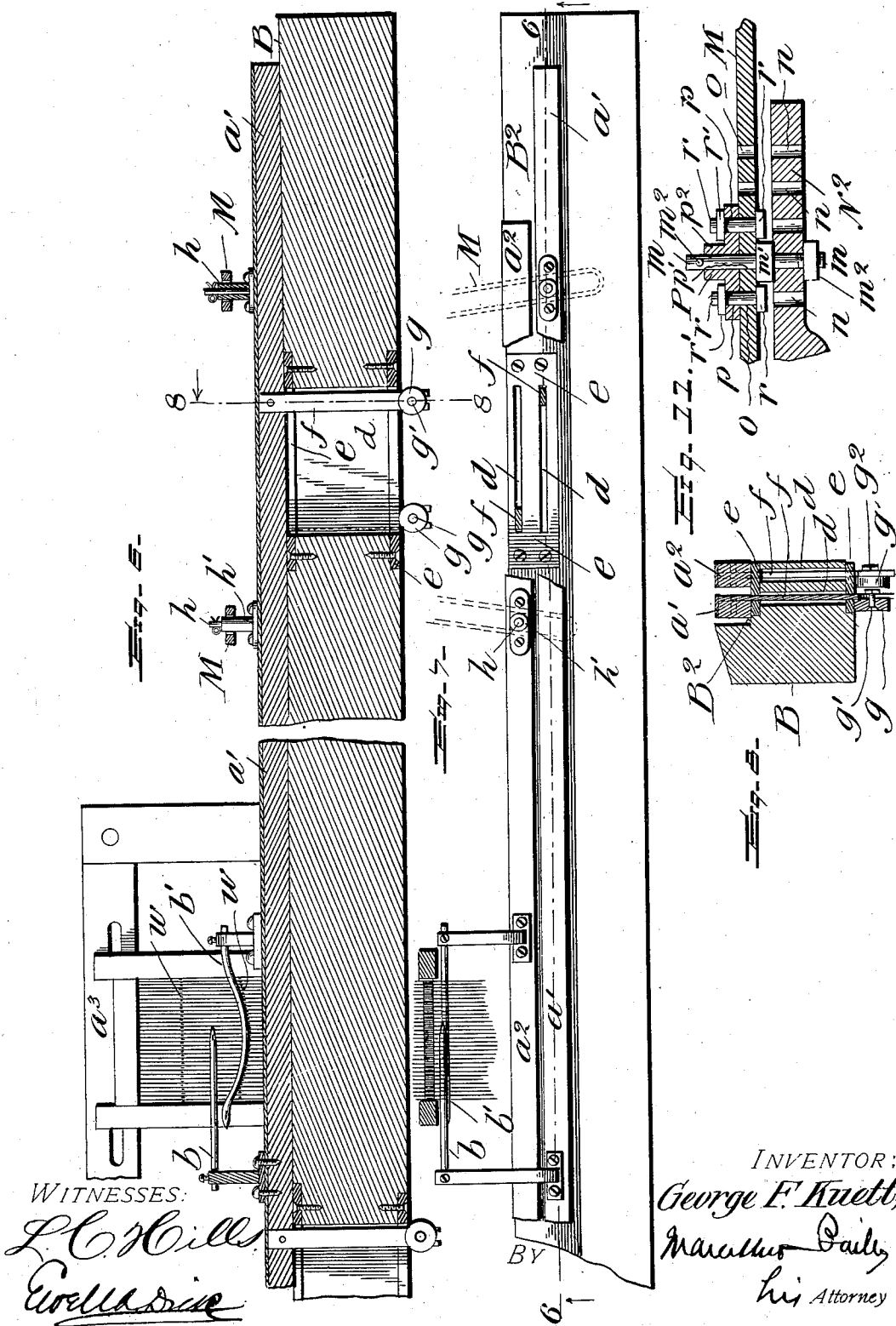
BY Marshall Peck
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LOOM.

(Application filed July 2, 1900.)

(No Model.)

5 Sheets—Sheet 4.



WITNESSES:

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No. 657,604.

Patented Sept. 11, 1900.

G. F. KUETT.

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(Application filed July 2, 1900.)

(No Model.)

5 Sheets—Sheet 5.

Fig. 9.

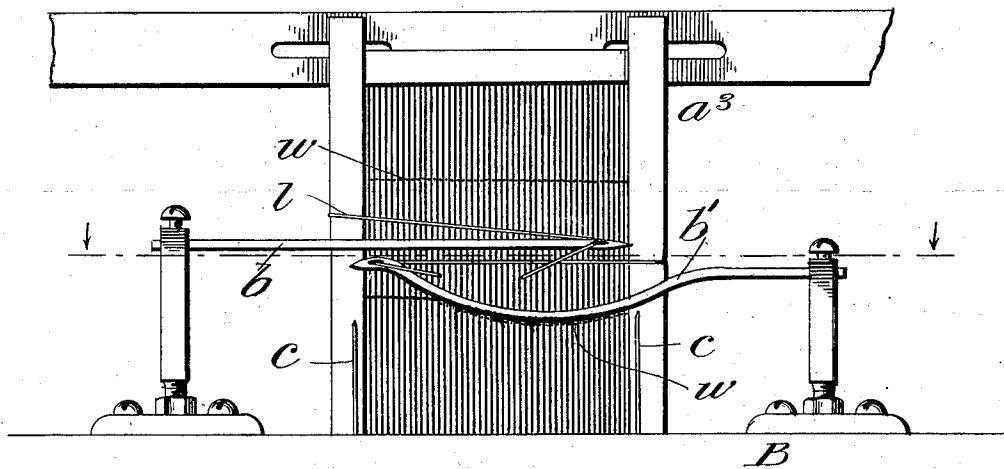
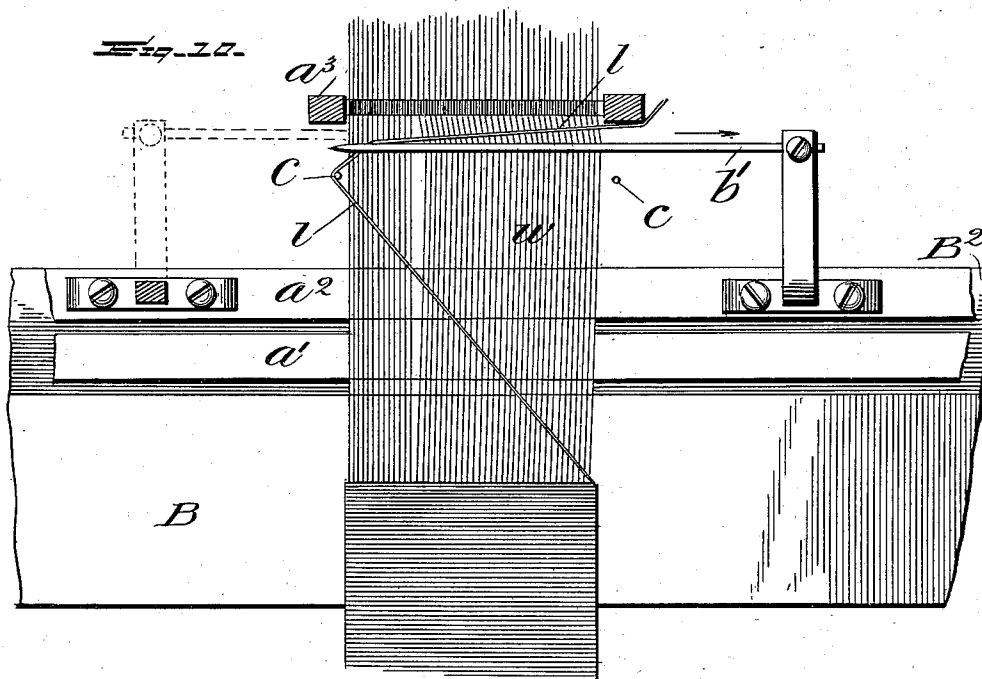


Fig. 10.



WITNESSES:

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UNITED STATES PATENT OFFICE.

GEORGE FRANCIS KUETT, OF PATERSON, NEW JERSEY, ASSIGNOR TO THE
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LOOM.

SPECIFICATION forming part of Letters Patent No. 657,604, dated September 11, 1900.

Application filed July 2, 1900. Serial No. 22,315. (No model.)

To all whom it may concern.

Be it known that I, GEORGE FRANCIS KUETT, a citizen of the United States, residing at Paterson, in the county of Passaic and State of New Jersey, have invented a certain new and useful Improvement in Looms, of which the following is a specification.

My invention has reference to that type of narrow-ware looms known as "needle-looms;" and it relates more particularly to the filling-inserting needles, which are reciprocated through the warp-sheds to lay the filling therein in the form of loops and to the devices for holding or carrying and operating said needles. In a loom of this type the reed is usually divided into a large number of sections, corresponding to the number of fabrics to be woven at one time, separate weaving devices, including the filling-inserting needles, being combined with each reed-section; and it is customary to mount all of these filling-inserting needles on one long bar or carrier if only one filling-inserting needle be used with each section or on two long bars or carriers if two filling-inserting needles be used with each section, adapted to lay the filling in the shed from opposite sides thereof either simultaneously or alternately, according as it is desired to lay two filling-loops or one filling-loop in each pick. Under my invention I curve or bend the filling-inserting needle lengthwise between its ends in a plane transverse to the warps, so that in passing across through the warp-shed it will exercise a wiping or combing action on the warps, thus putting the shed in best condition for work and loosening any ends or strands which may have become entangled and bound together. I find this construction to be very effective for the purpose. The filling-inserting-needle carriers or traverse-bars usually have been mounted side by side in a raceway or raceways formed in the top of and lengthwise of the batten or lay. Owing to accumulations of dust and refuse and to variations in temperature and hygrometric conditions these bars are apt at times to bind and jam or stick in their raceways, thus rendering it difficult to operate them. At the same time by frictional contact with the batten and consequent wear they are apt in time to work loose and to shake and tilt laterally, as well as to lift or rise, in their raceways, thus producing uncertain and

imperfect action of the filling-inserting needles, which are fast to and move with them. These defects I entirely obviate by arranging the traverse-bars so that they in effect simply lie on top of the batten or lay, having no contact with each other and having no contact with the batten except on their undersides, which rest on the batten. I guide the traverse-bars in their movements by means of thin metal fins secured at intervals to their undersides and projecting downward through slots of suitable length formed in and lengthwise of the batten or lay, these fins not only guiding the carriers in their longitudinal movements, but also serving as stays to prevent any lateral vibration or shake and tilt of said carriers. The fins fit snugly in the slots in the batten, and at the top and bottom of each I provide a removable plate, of hard wood or other suitable material, which bounds the edges of the slot and can be removed and replaced in order to compensate for wear. To prevent this traverse-bar from lifting or rising, I mount in the projecting lower end of each fin an antifriction-roller or other like or suitable antifriction device, which bears against the bottom of the lay or batten, and thus serves to hold the traverse-bar to which it is attached securely in place. Under this arrangement there is no liability of the traverse-bars to stick or jam, friction is reduced to a minimum, and all appreciable side shake or tilting is prevented. In order to reciprocate the traverse-bars, I combine with each of them a lever of the first order, which at one end directly engages an operating-cam, and at a point between its two ends is fulcrumed to the frame of the loom, so as to vibrate in practically a horizontal plane. This lever engages the traverse-bar by a slot-and-pin connection, which will permit the lever to actuate the traverse-bar, while the latter is at the same time left free to move with the batten or lay on which it is mounted, and between the fulcrum of the lever and the point at which it engages the traverse-bar is a support on which the lever rests and over which it can move, so as to be held practically out of contact with the batten. The fulcrum of the lever is also so arranged that it may be shifted lengthwise of the lever, so as to lengthen or shorten the throw of the needle at pleasure (according to the width of

fabric to be woven) without disturbing or shifting the point at which it engages the operating-cam.

In the accompanying drawings, to which I will now refer for a more complete understanding of my invention, Figure 1 is an end elevation of so much of a loom as requisite for the purpose of illustrating my improvements. Fig. 2 is a plan of the same, showing the loom for a portion of its length only. Fig. 3 is an enlarged perspective view of the mechanism for operating the traverse-bars. Fig. 4 is a sectional perspective view of the batten or lay, showing the slots in the batten, through which pass the fins on the bottom of the traverse-bars. Fig. 5 is a perspective view of a part of one of the traverse-bars, showing one of the fins and retaining-roller, with which it is provided. Fig. 6 is a section on line 6 6, Fig. 7. Fig. 7 is a plan of a portion of the batten. Fig. 8 is a section on line 8 8, Fig. 6. Fig. 9 is an elevation; and Fig. 10 is a plan of one reed-section and the horizontal needles appertaining thereto, designed to illustrate the action upon the warps of the bent or curved filling-inserting needle as it passes through the warp-shed. Fig. 11 is an enlarged sectional detail view showing the adjustable fulcrum or pivot for the traverse-bar-operating lever.

The particular loom shown in the drawings is one in which the filling-inserting needles movable lengthwise of the lay and the reed-sections are combined with filling-loop-engaging needles reciprocated in a path transverse to that of the filling-inserting needles and provisions for moving said loop-engaging needles toward the reed and the edge of the warp, as set forth in my Letters Patent No. 653,249, dated July 10, 1900. I have, however, omitted to here represent the vertical loop-engaging needles (except in Figs. 9 and 10, where they are shown diagrammatically only) inasmuch as they are unnecessary to an understanding of my present improvements. For the same reason I have here omitted the tension and take-up devices of my said patent. The movement of the parts in my present loom are much the same as that of those in my said patent save that here the traverse-bars move simultaneously, while there they move alternately. It is merely a matter of adjustment of the operating-cams to obtain either movement, or, if desired, one traverse-bar obviously may be thrown out of action altogether.

A is the loom-frame. B is the lay or batten, hung from the frame on lay-swords C. D is the main or drive shaft from a crank E, on which the lay is oscillated through the intermediary of a connecting-rod F. G is the breast-beam. All these parts may be of any usual or desired construction.

Mounted on the lay in any usual manner is the reed a^3 , which may be formed in sections corresponding to the number of fabrics desired to be woven at one time, and mounted

to slide upon and lengthwise of the lay are two filling-inserting-needle carriers or traverse-bars $a' a^2$. With each reed-section is combined harness a^4 for forming the warp-shed, two horizontal filling-inserting needles $b b'$, secured to the traverse-bars $a' a^2$, respectively, for inserting the filling l from opposite sides or edges of the warp-shed, and two vertically-reciprocating filling-loop-engaging needles $c c$, Figs. 9 and 10, these parts, together with a take-up and tension, (not shown,) operating together in the same general way as set forth in my Letters Patent No. 653,249, hereinbefore referred to.

The warps which form the shed are shown at w . One of the filling-inserting needles—in this instance the needle b' —is curved or bent lengthwise between its ends in a plane transverse to the warps, as shown more particularly in Figs. 6, 7, and 10, the bend being in this instance downward and toward the under warps of the shed. By thus forming the needle its bellying portion when the needle traverses the shed wipes over and depresses the under warps and exercises a combing action thereon, which is very effective to separate and loosen such strands as may have become entangled or bound together by loose filaments and fibers and to put the warps in the best condition for work.

The traverse-bars $a' a^2$ are placed upon the top of the lay B, preferably in a longitudinal recess or notch B^2 , formed in the top of the lay at its edge which faces or is nearest to the reed, so that their tops shall be about flush with the top of the lay. They lie in this recess, resting upon the bottom of the recess, but having no contact either with the side of the recess or with each other. To guide them in their movements, each traverse-bar is provided at intervals throughout its length with downwardly-projecting flat strips or fins f , of metal or other suitable material, which extend through slots d , extending vertically through the lay and of a length sufficient to permit the bars to have the requisite traverse movement. These slots at top and bottom are provided with slotted scutcheons or plates e , which are let into and removably secured to the lay, as shown in Figs. 4, 6, 7, and 8. These scutcheons are made of a hard substance, which will resist wear. I find boxwood very suitable for this purpose; but any other substance or material may be used. The slots in them are of a width to fit the fins f without undue friction, but closely enough to prevent appreciable lateral play. The slot in the body of the lay between the top and bottom scutcheons need not fit the fin accurately, nor, indeed, need its sides have contact with the fin. In this way I obtain for the traverse-bars, with minimum friction, a long and extended bearing in a vertical sense, which will effectually prevent any lateral shake or tilting of the bars during their reciprocatory movement, thus rendering the needles $b b'$

most accurate and precise in their action. The object of making the scutcheons *e* removable is to permit any one which becomes worn or damaged to be removed and replaced by a fresh one. The lower end of the fin, which projects down through and beyond the bottom scutcheon, is slotted, so as to have a yoke form, as seen in Figs. 5 and 6, and in this yoke is removably secured, by means of a set-nut *g*², the axle *g*¹ of an antifriction-roller *g*, which latter, as seen in Figs. 6 and 8, bears upon the under side or bottom of the lay, and thus serves to hold the traverse-bar, to which it pertains, down in place during its reciprocatory movement. The fins *f* without these antifriction-rollers would still be effective to prevent lateral tilt and shake of the traverse-bars, and to hold down the latter I might use antifriction devices secured to the top of the lay and overhanging the traverse-bars, as is now sometimes done; but I prefer the arrangement described, both on the score of efficiency and simplicity and because it leaves the top of the lay to that extent more open and free from mechanical devices.

It remains to describe the mechanism for imparting movement to the traverse-bars, said mechanism being fully shown in Figs. 1, 2, and 3. These bars are reciprocated by means of levers *M M*, each of which at one end engages its appropriate traverse-bar *a*¹ or *a*², at the other end engages its appropriate operating-cam *J* or *K*, and at a point between its ends is fulcrumed or pivoted to the frame of the loom or to some part attached thereto, the fulcrum or pivot pin being shown at *m*. The cams *J K* are fast on a shaft *L*, which is driven from crank-shaft *D* through gearing *H I*. In the present instance the cams by adjustment are so timed as to reciprocate the traverse-bars *a*¹ *a*² simultaneously in opposite directions, thus causing two filling-loops to be laid in the shed simultaneously from opposite sides of the warpshed at each reciprocation; but, as hereinbefore stated, it is obvious that by adjustment of the cams the traverse-bars may be made to reciprocate alternately, or one of the bars might be thrown out of operation altogether. Each lever directly engages its traverse-bar by a pin-and-slot connection, each bar having secured to it a vertical pin *h*, (having on it a roller-sleeve *h*¹ to reduce friction,) which enters a longitudinal slot *i* in the front arm of the lever. In this way the lever can reciprocate the traverse-bar, while at the same time the latter is left free to oscillate back and forth with the lay on which it is mounted. The front arms or ends of the levers *M* have no contact whatever with the lay. They are held above and out of contact therewith, for this purpose resting upon and moving over the face of a supporting-frame *N*, secured to the frame of the loom. This supporting-frame, which carries the levers, is mounted and held upon an axle or fixed shaft *N'*, secured to the frame

A, Fig. 3, being held to said shaft or axle by a set-screw *n*¹, by loosening which the frame *N* can be tilted on the shaft *N'* as an axis; so as to accurately adjust the connections of each lever with its traverse-bar and its operating-cam, respectively. Each lever engages its operating-cam through the intermediary of an antifriction-roller pin *p*, which enters the peripheral cam-groove in the cam. This pin *p* is vertically over the axis of revolution of the cam, or, in other words, is situated in a plane which passes longitudinally through the axis of the revolution of the cam and is at right angles with the plane of oscillation of the lever.

For each lever *M* there is a fulcrum-plate *N*², through which and the lever passes the fulcrum or pivot pin *m*. Each plate *N*² is mounted upon the axle or fixed shaft *N'* and is held thereon by a set-screw in the same way as the supporting-frame *N*, already referred to and as is illustrated clearly in Fig. 3. The fulcrum or pivot pin *m* has on it a boss *m*¹, interposed between the fulcrum-plate and the lever, so as to hold the two out of contact, and thus reduce friction and wear.

It is desirable to vary the throw of the front ends of the lever, and consequently the extent of traverse movement of each traverse-bar, to accord with the width of fabric to be woven in the loom. This can be done by varying the leverage or the relative length of the two arms of the lever. It is essential, however, that this should be done without change in the position of the pin *p* with respect to its operating-cam, and to effect this result I provide for shifting the position of the fulcrum or pivot *m* lengthwise of the lever in the following way: In and lengthwise of the fulcrum-plate *N*² is formed a series of holes *n* and in the lever *M* is formed a corresponding series of holes *o*, which register with holes *n*. The fulcrum or pivot *m* is made removable, so that it may be shifted from one hole to another, and thus the leverage can be varied; but as the pivot is removable it will be liable to work loose and to shake or tilt, thus rendering the action of the lever uncertain. To remedy this and to hold the pivot-pin absolutely steady in whatever position it may be placed, I provide a steady-plate *P*, having in it three holes *p p p'*, the central one, *p'*, having a raised hub *p*², being for the fulcrum-pin *m* and the two end holes for the reception of steady pins or bolts *r*. The holes *p p p'* are equally spaced apart, and the holes of each of the series *o* and *n* are correspondingly spaced. Thus when the fulcrum-pin passing through the central hole *p'* is in one set of holes *n o* in the lever and fulcrum-plate the holes *p p* for the steady-bolts *r* will each be over and in register with a corresponding hole in the lever below. The bolts when in place are secured by nuts *r*¹, which bind the steady-plate fast to the lever, and this plate by the hole *p*² furnishes an elongated bearing for the lever upon the fulcrum-

pin, which is adjustable with the fulcrum-pin. The fulcrum-pin is secured by a nut m^2 on its screw-threaded lower end below the fulcrum-plate N^2 and by a cotter-pin m^2 in its upper end, which projects above the hub p^2 of the steady-plate.

In lieu of curving or bending the body of the needle, as hereinbefore provided, the same result obviously may be secured in other ways, what is essential being that the needles should be provided with a projecting part arranged and adapted to wipe over or upon the warps during the traverse of the needle through the warp-shed, and I desire to be understood as including any such obvious modification in my claim. I prefer, however, the construction hereinbefore illustrated on the score of simplicity, lightness, and cheapness.

Having described my improvements and the best way now known to me of carrying the same into effect, what I claim herein as new and of my own invention is as follows:

1. In a needle-loom and in combination with the reed the lay and warp-shed-forming mechanism, a filling-inserting needle to traverse the warp-shed to lay the filling in loop form therein, formed or provided back of its point with a curved projecting portion in a plane transverse to the warps arranged and adapted to wipe over or upon the warps during the traverse of the needle through the warp-shed, substantially as and for the purposes hereinbefore set forth.

2. In a needle-loom and in combination with the lay provided with guide-slots, a filling-inserting-needle carrier or traverse-bar mounted to slide lengthwise on said lay, and provided at intervals throughout its length with downwardly-projecting fins which enter and pass down through said guide-slots, and engage the same so as to resist any tendency to lateral tilt or movement of the traverse-bar during its reciprocations, substantially as and for the purposes hereinbefore set forth.

3. In a needle-loom and in combination with the lay provided with guide-slots a filling-inserting-needle carrier or traverse-bar provided at intervals throughout its length with downwardly-projecting fins which enter and pass down through said slots, said slots being so formed that the fins have contact with the sides of the same at the top and bottom edges thereof only, substantially as and for the purposes hereinbefore set forth.

4. In a needle-loom, a lay provided at intervals throughout its length with vertical slots, provided at the top and bottom with removable slotted scutcheons, in combination with a filling-inserting-needle carrier or traverse-bar provided with downwardly-projecting fins to enter and pass through said slots and to laterally engage said scutcheons, substantially as and for the purposes hereinbefore set forth.

5. In a needle-loom, a lay provided at intervals throughout its length with vertical slots,

in combination with two filling-inserting-needle carriers or bars, mounted to slide upon the lay out of contact with each other, and having contact with the lay only on their bottom or under side, and provided with downwardly-projecting fins which enter and pass through and laterally engage the slots in the lay, substantially as and for the purposes hereinbefore set forth.

6. In a needle-loom and in combination with a lay provided at intervals throughout its length with vertical slots, a filling-inserting-needle carrier or traverse-bar mounted to slide on said lay, fins attached to said traverse-bar, projecting downwardly through and laterally engaging said slots, and hold-down devices secured to the lower ends of said fins and bearing against the under side of the lay, substantially as and for the purposes hereinbefore set forth.

7. In a needle-loom and in combination with the lay and a filling-inserting-needle carrier or traverse-bar mounted to move lengthwise thereon, a traverse-bar-actuating lever having a longitudinally-slotted front end to engage a pin on the traverse-bar, an operating-cam engaging the opposite or rear end of the lever, a fulcrum or pivot for the lever between its two ends, and a fixed or stationary support over which the front end or arm of the lever plays and by which it is held during its movement above and out of contact with the lay, substantially as and for the purposes hereinbefore set forth.

8. In a needle-loom the combination of the lay, a filling-inserting-needle traverse-bar mounted to move lengthwise thereon, an actuating-lever engaging at one end the traverse-bar, an operating-cam engaging the opposite end of said lever and an adjustable tilting frame on which said lever is supported and pivoted, substantially as and for the purposes hereinbefore set forth.

9. In a needle-loom, the combination with the lay and a filling-inserting-needle carrier mounted to move lengthwise thereon, an actuating-lever engaging at one end the traverse-bar, and at the other end an operating-cam, and provided with a series of holes for reception of a fulcrum-pin, a fulcrum-plate provided with a corresponding series of holes, a fulcrum-pin to engage any one set of holes in the fulcrum plate and lever, a steady-plate provided with an elongated bearing through which the fulcrum-pin passes, and steady-pins for adjustably securing the steady-plate to the lever, and to permit it to be shifted when the fulcrum-pin is shifted, substantially as and for the purposes hereinbefore set forth.

In testimony whereof I have hereunto set my hand this 27th day of June, 1900.

GEORGE FRANCIS KUETT.

Witnesses:

CHAS. L. MANDEVILLE,
WILLIAM E. FISCHER.